

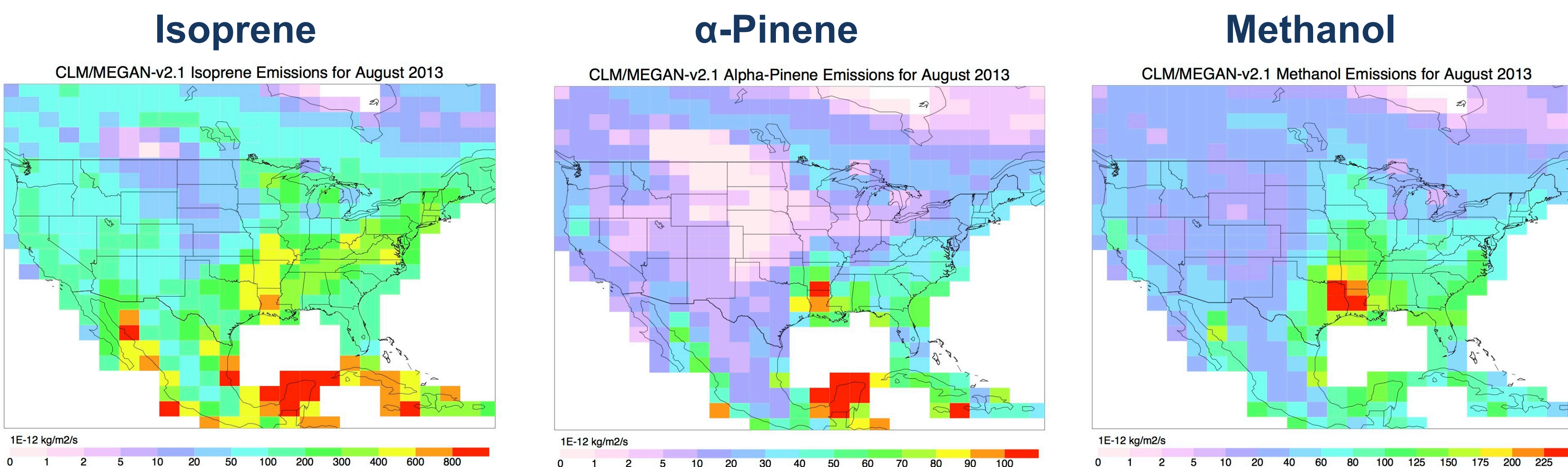
Evaluation of CAM-Chem with MEGAN with SEAC4RS observations

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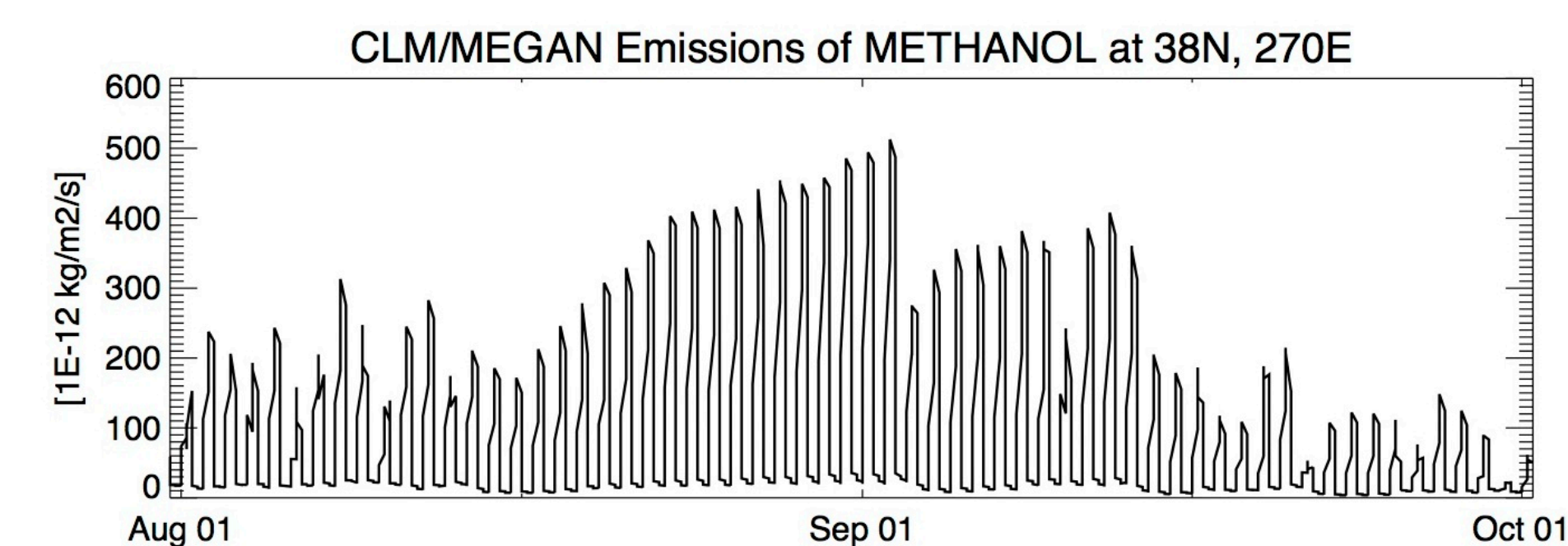
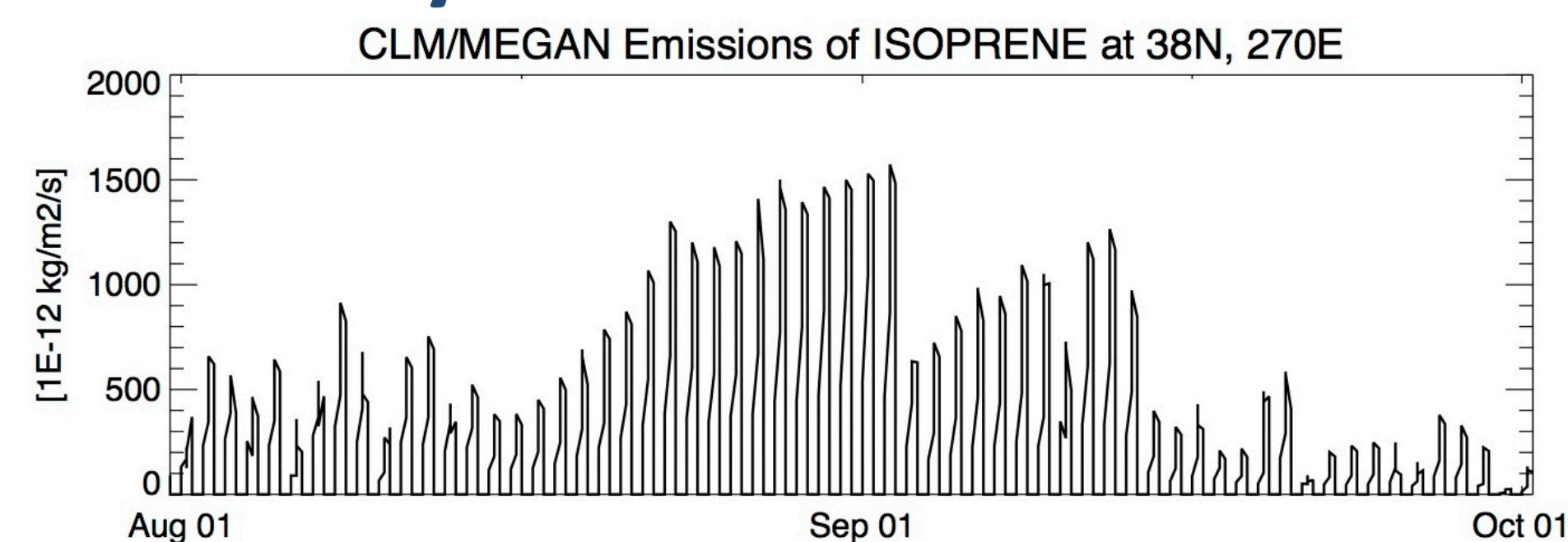
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The Model of Emissions of Gases and Aerosols from Nature (MEGAN), version 2.1 [Guenther et al., GMD, 2012], has been incorporated in the NCAR Community Land Model (CLM). CLM is coupled to the CAM-chem (Community Atmosphere Model with chemistry) allowing for a more detailed simulation of biogenic compounds in a global model than has been available previously. MEGAN calculates 140 compounds in CLM which are then lumped to match the atmosphere model chemistry.

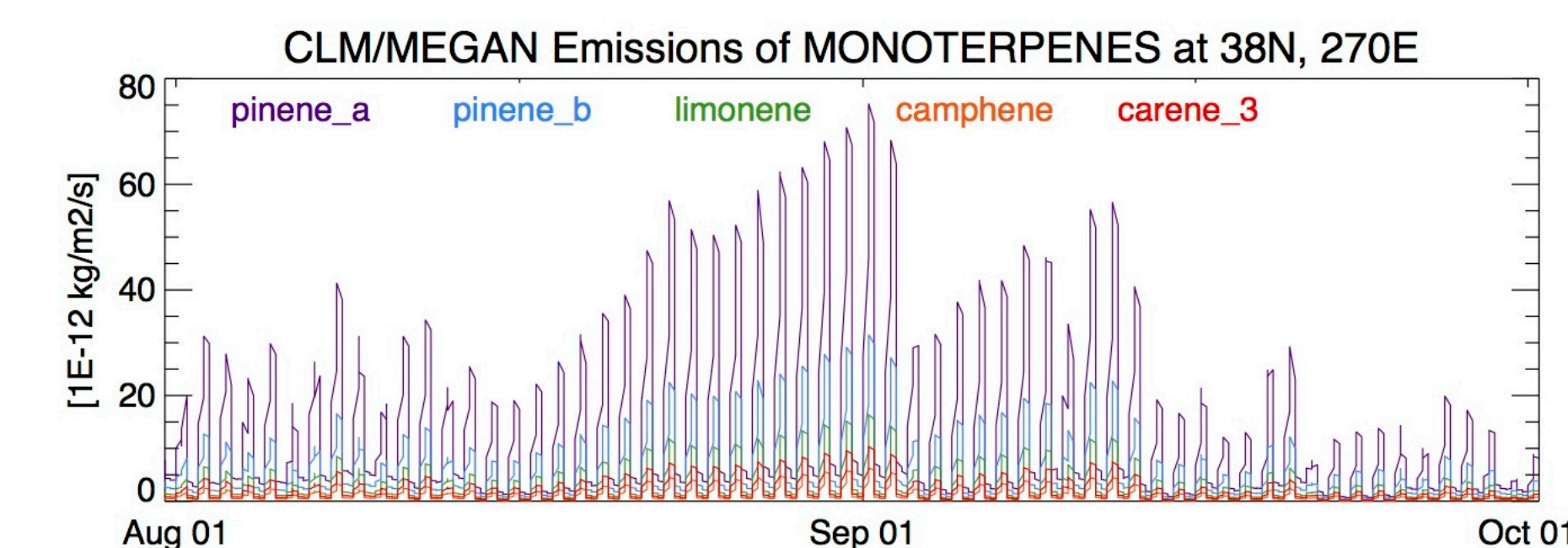


Hourly emissions in the Ozarks



Emissions are calculated online in CLM at each model timestep using the model meteorology, in this case specified from GEOS-5.

Isoprene has a strong diurnal cycle driven by solar radiation, with daily variability driven by clouds and temperature. Methanol also has strong light-dependent emissions, but acetone and many terpenes have emissions primarily driven by temperature.



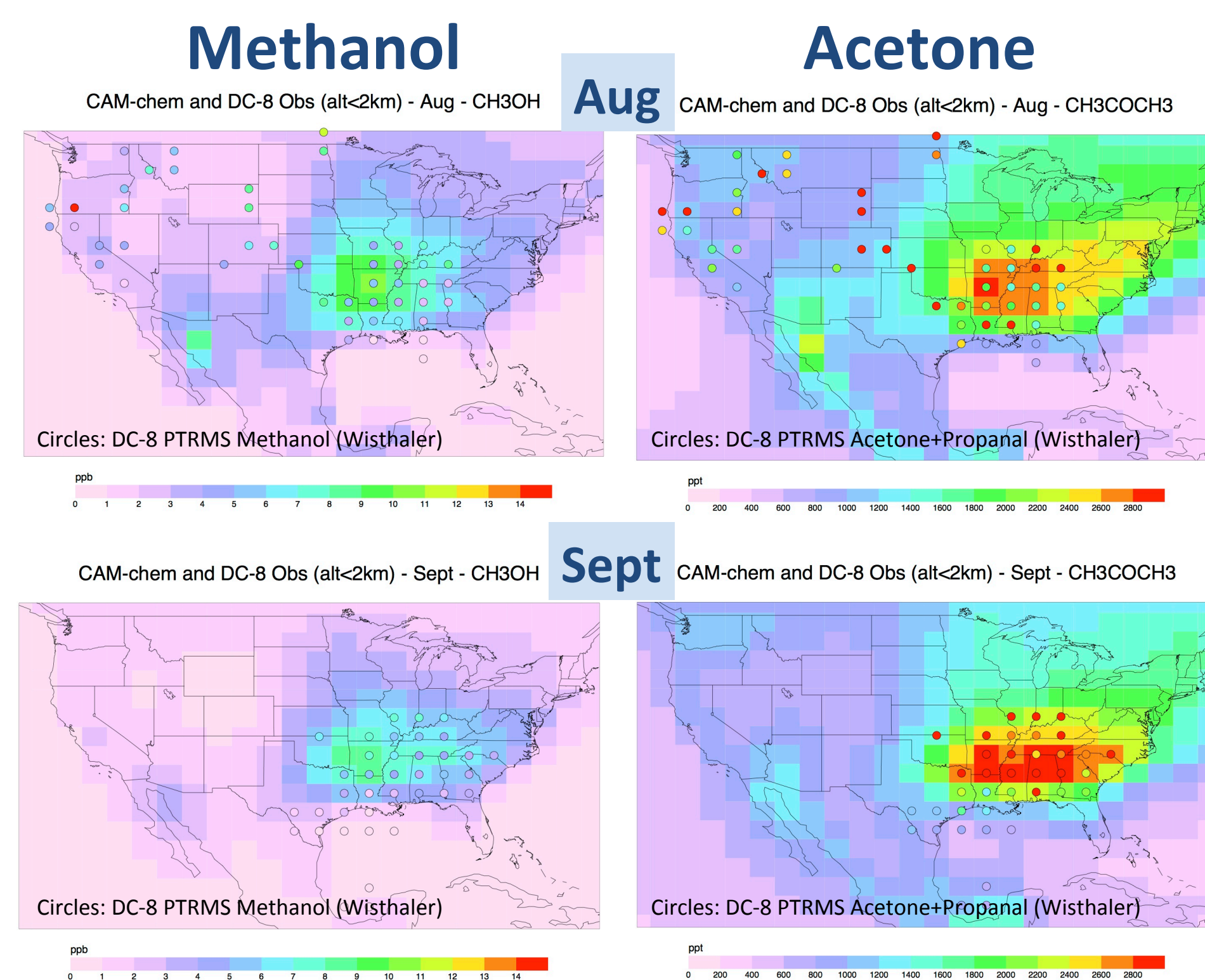
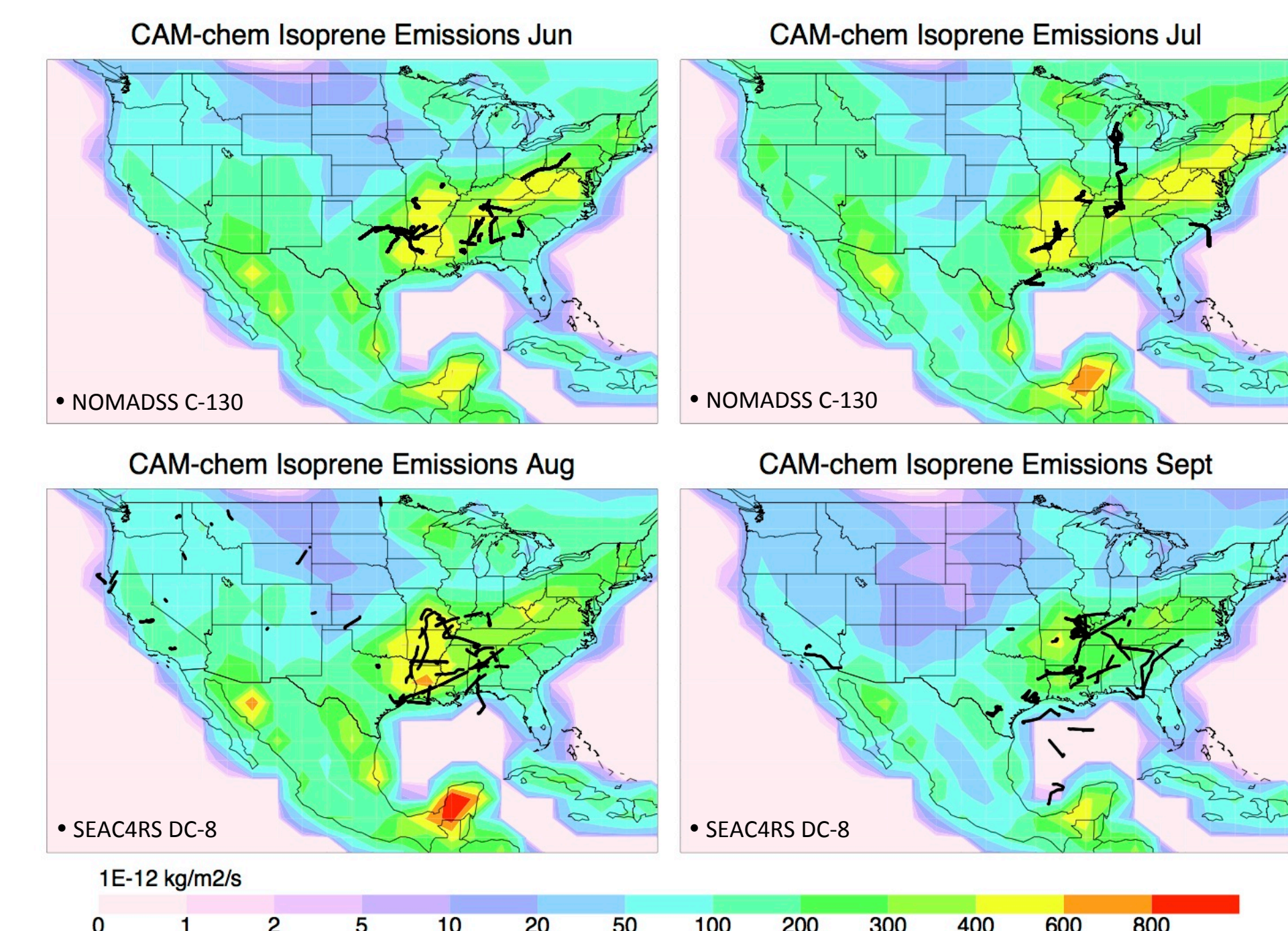
CAM-chem results will be made available:

- Interpolated to the DC-8 flight tracks
- Results for ground sites
- Emissions maps

Contact Louisa Emmons with additional requests

Monthly average emissions of Isoprene for June to September are shown with flight track locations below 2km: NOMADSS C-130 for Jun-Jul and SEAC4RS DC-8 for Aug-Sept.

Both SAS and SEAC4RS data sets will be used to evaluate MEGAN emissions through the summer.



Boundary Layer Comparisons for evaluation of emissions

CAM-chem with online MEGAN-v2.1 biogenic emissions, GEOS-5 dynamics, monthly mean averages

DC-8 Observations:
PTRMS - Armin Wisthaler
Averaged to the model grid, all flights for each month (circles)

MEGAN emissions of Methanol and Acetone appear high in SE U.S. during August

Fire emissions in western U.S. may be under-estimated, or under-estimate may be just a result of monthly average

Agreement is a bit better in September

DC-8 Observations:
UC-Irvine Whole Air Sampler – Don Blake, Nicola Blake
Averaged to the model grid, all flights for each month (circles)

Ethane and Propane are emitted by fires and anthropogenic sources

Sources are clearly missing from emissions inventory in regions of oil and gas extraction

